

Project Title: SBEADMR

Biological Evaluation and Assessment, Management Indicator Species Assessment<sup>1</sup>, Fisheries and Aquatics

Grand Mesa, Uncompahgre, and Gunnison National Forests

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Reviewed by: NA

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Date: January 21, 2016

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<sup>1</sup> Meets the standards for both a Biological Evaluation (FSM 2672.42) and Biological Assessment (50 CFR 402.12(f)).

## **1. Introduction**

*The purpose of this document is to present the analysis and determination of effects of the alternatives on federally listed species (endangered, threatened, and proposed), Forest Service sensitive species (FSM 2670.31-2670.32) and Management Indicator Species (1982 Planning Rule 36 CFR 219.19(a)(6)) The objective is to establish a standard format to complete required analysis for these species or species groups.*

*This biological evaluation report (BE) conforms to legal requirements set forth under section 7 of the Endangered Species Act (ESA) (19 U.S.C. 1536 (c), 50 CFR 402.12 (f) and 402.14). Section 7(a) (1) of the ESA requires federal agencies to use their authorities to further the conservation of listed species. Section 7(a) (2) requires that federal agencies ensure any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of federally-listed species, or destroy or adversely modify designated critical habitat.*

*Forest Service policy requires that a review of programs and activities, through an effects analysis document (referred to in current Forest Service policy as a biological evaluation or BE), be conducted to determine their potential effect on threatened and endangered species, species proposed for listing, and Regional Forester-designated sensitive species (FSM 2670.3). Under the ESA, the effects analysis report is called a biological assessment (BA) and must be prepared for federal actions that are “major construction activities” to evaluate the potential effects of the proposal on listed or proposed species and critical habitats. The contents of the BA are at the discretion of the federal agency, and will depend on the nature of the federal action (50 CFR 402.12(f)). A BE may be used to satisfy the ESA requirement to prepare a Biological Assessment. Preparation of a Biological Evaluation as part of the NEPA process ensures that TEPS species receive full consideration in the decision-making process.*

*The 1982 Planning Rule 36 CFR 219.19(a)(6) related to Management Indicator Species (MIS) requires the Forest Service to produce a unique list of species to represent Forest communities or ecosystems. These species and the ecosystems in which they represent must be considered for each project to evaluate consistency with the Forest Plan. MIS fishes on the GMUG NF include Brook Trout, Brown Trout, non-native Cutthroat Trout, and Rainbow Trout. Collectively these species are known as Common Trout.*

## **2. Description of the Proposal**

The Spruce Beetle Aspen Decline Management Response (SBEADMR) project is a forest-wide effort to harvest timber and perform fuels treatments in the wake of landscape-scale changes to forest ecosystems on GMUG lands. SBEADMR includes both commercial timber harvest and non-commercial fuels treatments. A detailed description of the proposal and alternatives is available for review upon request and Supervisor’s Office in Delta, Colorado.<sup>2</sup>

For planning and implementation of SBEADMR, the Forest is divided into six geographic areas: 1) Grand Mesa; 2) North Gunnison; 3) South Gunnison; 4) North Fork Valley; 5) San Juans; and 6)

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<sup>2</sup> Contact information: 2250 Highway 50 Delta, Colorado 81416.

Uncompahgre Plateau. Geographic areas are listed in order of priority for treatment during SBEADMR, with treatments on the Grand Mesa the highest priority and treatments on the Uncompahgre Plateau the lowest priority. This document includes an analysis of Alternatives 2 and 3, as identified in the proposed action. Alternative 2 is the alternative preferred by the GMUG NF and includes approximately 207,615 acres of priority treatment areas. Alternative 3 includes approximately 127,023 acres of priority treatment areas. Additional acres of “other” vegetation type are included in the noncommercial PTA boundaries but are not analyzed, as they would not be treated. Both alternatives include substantially more acreage of priority treatment areas than is feasible to treat in the 8-12 year lifespan of the project. Priority Treatment Areas identified in Alternative 3 are subsets of the PTAs identified in Alternative 2. There is very little difference in the spatial layout of PTAs under each alternative. Because the watersheds that will be affected do not differ between Alternatives, rivers, streams, and wetlands that could be impacted do not differ. Therefore, this document presents a single analysis based on the assumption that the location, rather than the size of a PTA within a watershed determines whether or not aquatic resources could be affected.

The Forest anticipates the effects of SBEADMR to vary across the landscape by forest type and treatment type. However, effects to aquatic systems and aquatic populations from active forest management have been long studied and are invariable: sedimentation and fragmentation increase (Meehan, Jr., 1991). While these effects are inherently negative, the fact that stream networks are 1-dimensional landscapes means aquatic populations can only be affected by active forest management within the watershed in which they reside. Analyzing effects to fishes is therefore simpler relative to an analysis of SBEADMR on, for example, elk whose populations exist in a 2-dimensional landscape and could be affected by alterations to habitat that they use seasonally.

### 3. Fish and Amphibian Species Considered and Analyzed

Name	Status	Present?	Habitat present?	Analyzed?
<b>Bonytail Chub</b>	Endangered	No	No	No
<b>Colorado Pikeminnow</b>	Endangered	No	No	No
<b>Humpback Chub</b>	Endangered	No	No	No
<b>Razorback Sucker</b>	Endangered	No	No	No
<b>Greenback Cutthroat Trout</b>	Threatened	Yes	Yes	Yes
<b>Bluehead Sucker</b>	Sensitive	No	No	No
<b>Colorado River Cutthroat Trout</b>	Sensitive	Yes	Yes	Yes
<b>Flannelmouth Sucker</b>	Sensitive	No	No	No
<b>Roundtail Chub</b>	Sensitive	No	No	No
<b>Brook Trout</b>	MIS	Yes	Yes	Yes
<b>Brown Trout</b>	MIS	Yes	Yes	Yes

<b>Non-native Cutthroat Trout</b>	MIS	Yes	Yes	Yes
<b>Rainbow Trout</b>	MIS	Yes	Yes	Yes
<b>Boreal Toad</b>	Sensitive	Treatment Area Dependent	Yes	Yes
<b>Northern Leopard Frog</b>	Sensitive	Treatment Area Dependent	Yes	Yes

#### 4. Consultation to Date

NA

#### 5. Species Information

##### Greenback Cutthroat Trout

A detailed description of the biology, ecology, and status of this species on the GMUG is available on the internet at:

<http://www.fs.usda.gov/detail/gmug/landmanagement/resourcemanagement/?cid=stelprdb5199668>

##### Colorado River Cutthroat Trout

A detailed description of the biology, ecology, and status of this species on the GMUG is available on the internet at:

<http://www.fs.usda.gov/detail/gmug/landmanagement/resourcemanagement/?cid=stelprdb5199668>

##### Management Indicator Species

A detailed description of the biology, ecology, and status of fish classified as Management Indicator Species on the GMUG is available on the internet at:

<http://www.fs.usda.gov/detail/gmug/landmanagement/resourcemanagement/?cid=stelprdb5199668>

**Boreal Toad:** Historically the Boreal Toad (BT, *Anaxyrus boreas boreas*) occurs in mountain habitats as low as 5,278 feet elevation in northern latitudes (Montana and Wyoming) and as high as 11,500 feet in the southern Rocky Mountains. Bartelt *et al.* (2004) observed boreal toads migrating seasonally in a linear pattern up to 1.6 miles, suggesting a home range of approximately 2.4 square miles. They migrate in late spring and early summer to aquatic areas such as marshes, wet meadows, streams, beaver ponds, and lakes for breeding. Post breeding and prior to hibernation, adult boreal toads move into terrestrial shrub cover types, preferring areas with edge habitat and open forest over forests with closed canopies or clearcuts (2004). In order to conserve body water, post reproductive migration normally occurs nocturnally when relative humidity is high (Bartlet *et al.* 2004).

In 1995, the FWS listed the Boreal Toad as a Candidate for federal protection under the Endangered Species Act (ESA). On September 29, 2005, the FWS announced the withdrawal of the Southern Rocky Mountain population of the BT from the list of species being considered for

protection under the ESA, which made it no longer a Candidate species (FWS 2005). However, Colorado Parks and Wildlife (CPW) considers Boreal Toad to be endangered within Colorado and it is designated as a USFS Region 2 sensitive species, receiving the protection afforded to species with this designation.

Once common in the Colorado Rocky Mountains (Burger and Bragg 1947), BT has experienced a severe decline in distribution and abundance which was first reported in the early 1990's. Within the GMUG National Forests, Carey (1993) documented the disappearance of eleven different populations of Boreal Toad within the West Elk Mountains between 1974 and 1982. Initially it was unclear what might be causing such a drastic reduction in distribution. Not until the late 1990's and early 2000's was the fungal disease chytridiomycosis (chytrid) identified as the main causative agent for the drastic decline in Boreal Toads.

Thought to have originated from Africa, chytrid has become widespread throughout the world due to the pet trade. Infecting the keratinized epidermal cells of living amphibian skin, *Batrachochytrium dendrobatidis* (*Bd*) is the actual fungus that causes chytrid. *Bd* is characteristically aquatic and unique from other fungi because it is capable of moving through water using a single flagellum. Not only is it motile but it can be transmitted from host to host through direct contact (territorial or breeding encounters), movement of surface water, in damp or moist soil and through the feathers of birds, especially waterfowl (Johnson and Speare, 2003; 2005). Although mammalian body temperatures preclude *Bd* infection both migrating aquatic and terrestrial mammals may also serve as vectors of this disease.

The survival and growth of *Bd* is highly temperature dependent (39.2-86°F), with optimum growth between 62.6-77°F (Piotrowski *et al.* 2004). Under temperatures of 86°F or greater 50% of *Bd* will die within 8 days, whereas within 4 days at 98.6°F total mortality will occur (Piotrowski *et al.* 2004). Temperatures of 140°F for 5 minutes also kill *Bd* (Johnson *et al.* 2003). Viable *Bd* cannot survive complete drying (desiccation) for more than three hours at room temperature (72°F) yet ultra violet light is ineffective to combat chytrid (Johnson *et al.* 2003). In a moist environment with organic matter *Bd* can be viable for as long as seven weeks (Johnson and Speare 2003).

Unfortunately for Boreal Toads, research suggests that they do not produce antimicrobial peptides in their skin which most frogs and salamanders have as part of their nonspecific (innate) immune response (Conlon *et al.* 2009). Boreal Toads do elicit a behavioral fever when infected with chytrid by basking and selecting high temperature microhabitats (Murphy *et al.* 2011). Such behavior may promote the growth of cutaneous bacteria that has been shown to inhibit *Bd* growth in salamanders (Harris *et al.* 2006). Although the specific processes at work are still unknown, both reducing time spent in aquatic habitats and warming of the body has been shown to either increase survival or eliminate the fungal infection all together (Murphy *et al.* 2011).

**Northern Leopard Frog:** The Northern Leopard Frog (*Rana pipiens*) is widely distributed in North America ranging from southern Canada south to Maryland, West Virginia and Kentucky, and westward to New Mexico, Arizona and eastern California. Northern Leopard Frog (NLF) can live between two to four years and typically has a home range between 161 ft<sup>2</sup> to 0.15 acres (Dole 1965). Merrell (1977) documented them moving up to a mile to overwintering hibernaculum but NLF can also overwinter along the bottom of perennial streams where temperatures are just above freezing (Cunjak 1986). Becoming sexually mature, individuals between 1-3 years old normally return to their natal waters between May and June for breeding. Aquatic bound tadpoles feed on phytoplankton, algae and periphyton, while adults and juveniles are semi-terrestrial and primarily foraging on land.

In 2009 the Northern Leopard Frog was petitioned for listing under the Endangered Species Act but in 2011 the U.S. Fish and Wildlife Service status review determined that listing throughout its range was not warranted (USFWS 2011). However, the Northern Leopard Frog is considered a USFS Region 2 sensitive species and does receive the protection afforded to species with this designation.

The decline of NLF, although not as drastic as Boreal Toad, has been attributed to several factors such as local drought, disease and invasive predator introductions. Chytrid was likely responsible in part for the initial decline but Northern Leopard Frog has been found to have multiple antimicrobial skin peptides which inhibit the growth of *Bd* (Rollins-Smith *et al.* 2005, Salmon *et al.* 2001, Tennessen *et al.* 2009). Having the innate immunity to survive chytridiomycosis, NLF have been found to act as reservoirs for *Bd* (Woodhams *et al.* 2008) further providing vectors of transmission to other amphibians.

## **6. Existing Conditions**

Greenback Cutthroat Trout (GBCT) have Endangered Species Act protection as a Threatened Species. Recent genetic research has resulted in an upheaval of the taxonomic status of several varieties of Cutthroat Trout thought to be native to Colorado (Metcalf *et al.*, 2012). The impact of genetic research could affect the regulatory status of this species; however, at this time populations of this type of Cutthroat Trout are considered Threatened under provisions of the Endangered Species Act.

There are 24 known Conservation Populations of GBCT on the GMUG. Conservation Populations are those having at least 90% native Cutthroat Trout genes and are monitored intensively by State and Federal management agencies (CRCT Conservation Team 2006). Recent research suggests this variety of Cutthroat Trout was aboriginal in western Colorado (Metcalf *et al.*, 2012) and resource management agencies, led by Colorado Parks and Wildlife, have begun to establish new populations in western Colorado. GBCT occupy relatively high elevation streams and are often isolated from the surrounding watershed by natural or human-made barriers. A qualitative examination of the distribution of GBCT Conservation Populations on the GMUG

suggests extant populations are located in areas where human presence is infrequent. Habitat quality and population size varies in occupied streams.

Colorado River Cutthroat Trout (CRCT) is a Sensitive Species in the USFS Region 2. Until recently this variety of Cutthroat Trout was believed to be aboriginal to western Colorado (Metcalf et al., 2012). The ongoing debate as to the “proper” taxonomic classification of several types of Cutthroat Trout native to Colorado does not affect the fact that Colorado Parks and Wildlife and Federal land management agencies manage western Colorado CRCT populations having at least 90% native Cutthroat Trout genes as Conservation Populations. Therefore, CRCT populations are monitored and managed in an identical manner to GBCT populations on GMUG lands.

There are 18 known CRCT Conservation Populations on the GMUG. Most of these populations were created through stocking by the state game management agency, now called Colorado Parks and Wildlife. Today these populations are self-sustaining. Habitat quality and population size varies in occupied water bodies. While not as isolated as extant GBCT populations, CRCT populations tend to be located in areas where human presence is limited. Native CRCT populations do not support recreational fisheries as popular as nearby non-native fisheries such as Blue Mesa Reservoir, the San Miguel River, and the Taylor River tailwater.

We identified CRCT populations that could be affected by SBEADMR’s Alternative 2 (Table 1). The populations listed below either occur in areas slated for treatment or have priority treatment areas in at least 20 percent of their contributing watershed. There are seven known Conservation Populations in priority treatment areas for SBEADMR. Six of these populations are green lineage meaning they are protected as Greenback Cutthroat Trout under provisions of the Endangered Species Act. The six populations listed below occupy approximately 26 stream miles. There is a total of approximately 100 stream miles occupied by GBCT on the GMUG. With respect to population size and density, none of the populations listed below is particularly large; however, the loss of approximately one quarter of habitat patches occupied by GBCT would likely be irreversible.

Table 1: Cutthroat Trout Conservation Populations associated with priority treatment areas.

CRCT Population	Lineage	SBEADMR Geographic Area
Dyke Creek	GBCT	Grand Mesa
East Fork Big Creek	CRCT	Grand Mesa
Cunningham Creek	GBCT	North Fork Valley
East Fork Terror Creek	GBCT	North Fork Valley
West Fork Terror Creek	GBCT	North Fork Valley
Beaver Dams Creek	GBCT	Uncompahgre Plateau
East Fork Dry Creek	GBCT	Uncompahgre Plateau
Pryor Creek	GBCT	Uncompahgre Plateau

Common Trout are ubiquitous on the GMUG because they are actively managed by the State of Colorado for recreational purposes. Any activity near perennial streams has the potential to impact Common Trout or their habitat. Timber management associated with the SBEADMR project may take place in close proximity to perennial streams that contain Common Trout. *The omnipresence of Common Trout species on the Forest makes it extremely unlikely specific actions or the cumulative effects associated with the SBEADMR project could impact Common Trout at a watershed or Forest scale.*<sup>3</sup>

**Boreal Toad:** Although GMUG Staff and Colorado Parks and Wildlife are continually conducting both occupancy and breeding site surveys for Boreal Toad, the size of the forest (approximately 3.1 million acres) precludes complete coverage. Currently several known populations of Boreal Toad occur on the GMUG National Forests. On the Grand Valley Ranger District there is a breeding population of Boreal Toad in the upper Buzzard Creek drainage including the 6<sup>th</sup> level sub-watersheds (HUC-12 digit) of Owens Creek (140100051101), Hightower Creek-Buzzard Creek (140100051103) and Headwaters Buzzard Creek (140100051102). Although these animals require aquatic habitat for breeding, because their home range is relatively large (2.4 mi<sup>2</sup>), each sub-watershed is considered habitat for Boreal Toad.

Likewise, on the Gunnison Ranger District, several populations of Boreal Toad exist. Although historically Boreal Toads were present in the West Elk Mountains and near Gothic, currently the only known BTs are in the Brush Creek (140200010202), Cement Creek (140200010207) Texas Creek (140200010104), and Upper Taylor River (140200010101) sub-watersheds. Due to the dry nature of the Uncompahgre Plateau there are no known populations in this area of the Uncompahgre National Forest (Grand Valley, Norwood and Ouray Ranger Districts).

The northern side of the San Juan Mountains in the Ouray and Norwood Ranger Districts and the Cimarron Mountains of the Ouray Ranger District do have suitable habitat for Boreal Toad but none have yet to be found. It is unclear whether the absence of Boreal Toad from these areas is a result of their historical distribution or complete extirpation (local extinction). It is important to note that surveys have not been conducted over most of the GMUG National Forests and that Boreal Toads may still be present in isolated pockets; therefore precautionary measures should be taken to limit the spread of chytrid throughout the GMUG National Forests.

**Northern Leopard Frog:** Although Northern Leopard Frog distribution in Colorado was historically widespread, similar to Boreal Toad, mass mortality events have been documented. Corn and Fogleman (1984) observed the extinction of nine populations of NLF in north central Colorado. In 1951 Blair noted that both BT and NLF were abundant in glacial ponds surrounding the Gothic Research Station, eight miles northeast of Crested Butte, CO. Carey (1993) then documented the complete disappearance of two of these populations between 1971 and 1982.

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<sup>3</sup> For a fictional description of human-caused events that could lead to Forest-wide declines in non-native Common Trout please read *The Road* by Cormac McCarthy.



Although a USFS Region 2 Sensitive Species, unlike the Boreal Toad, the NLF is only classified by CPW as a Species of Concern. As such CPW has not conducted extensive presence and local distribution data for Northern Leopard Frog. Therefore presence of specific populations of NLF within project areas is yet to be determined. Analysis and design criteria discussed below take into consideration the possible presence of Northern Leopard Frog.

## 7. Effects of Alternatives

- A. **Direct Effects** – There are a several potential direct effects of forest management activities on amphibians, fishes and aquatic stream habitat. These include mortality due to the operation of equipment in or around wetlands, stream channels, destruction of stream habitat due to the operation of equipment in a stream channel, and fragmentation of stream habitat due to the installation of a road-stream crossing that prevents organism passage. Additionally, because Boreal Toad have such a wide home range relative to its size, foraging in upland areas, direct mortality could be caused by ground based vegetative management activities. These include noncommercial activities such as mastication and fuels reduction.
- B. **Indirect Effects** – Potential indirect effects to streams of forest management practices in a watershed include erosion from roads and timber harvest in the riparian area or on surrounding hillslopes, as well as increased stream temperature due to harvest of riparian vegetation.  
CRCT populations identified in Table 2 could experience indirect effects as a result of SBEADMR. For CRCT our effects determinations for direct and indirect effects apply only to the seven populations identified in Table 2. All other CRCT populations will not be affected by SBEADMR.  
Transport and use of logging equipment (both commercial and non-commercial) between hydrologic catchments could result in the spread of the amphibian chytrid fungus. Furthermore, movement and operation of vegetative management equipment can reduce or destroy hibernation locations by crushing woody debris and soil compaction.
- C. **Cumulative Effects** – Cumulative effects that could be manifested as SBEADMR is implemented include additive sedimentation from new roads and harvest activities that occur in watersheds with existing road networks, additive fragmentation of stream networks by improperly designed road-stream crossings, and stream temperature increases that occur because of the combined effects of riparian vegetation harvest and regional climate change.

## 8. Design Features

Design features incumbent to the SBEADMR project preclude harvest-related activities in and very near to stream channels. Therefore, impacts to CRCT from the effects described above

would not occur as SBEADMR is implemented. The following table defines potential effects and lists specific design features that render analysis of the potential impacts moot.

Table 2: SBEADMR design features that will protect stream habitat and resident aquatic populations.

<b>Effect</b>	<b>Design Feature(s)</b>	<b>Comments</b>
<b>Direct mortality of CRCT</b>	WQSP-2A	See Section 10
<b>Habitat destruction</b>	WQSP-2A	See Section 10
<b>Stream network fragmentation</b>	WQSP-3A; WQSA-3B; WQSP-8A(B)	WQSP-3A states that aquatic biologists will participate in the design of road-stream crossings. WQSP-3B states temporary crossings will be removed from streams upon completion.
<b>Erosion from surrounding watershed</b>	TSHR-1; TSHR-2; WQSP-5A; WQSP-6; WQSP-7A; WQSP-8B; MNTG-1	At least one member of the Aquatics Team will participate in the planning and implementation of project-level harvest activities.
<b>Increased stream temperature from riparian harvest</b>	WQSP-2A; MNTG-1	The Aquatics Team has the ability to perform long-term stream temperature monitoring to quantify the effect (if any) of harvest near streams on stream temperature.
<b>Additive erosion in watersheds with existing dense road network</b>	TSHR-1; WQSP-6; WQSP-7A; WQSP-8A; WQSP-8B; MNTG-1	At least one member of the Aquatics Team will participate in the planning and implementation of project-level harvest
<b>Additive stream temperature increase due to riparian harvest and climate change</b>	WQSP-2A	See below
<b>Spread of Amphibian Chytrid Fungus</b>	WFRP - 24	At least one member of the Aquatics Team will participate in the planning and implementation of project-level operations
<b>Mortality of Boreal Toad and Reduction of Hibernaculum Habitat</b>	WFRP - 25; WFRP - 26	At least one member of the Aquatics Team will participate in the planning and implementation of project-level operations

Climate change has the potential to affect aquatic populations by reducing the amount of suitable habitat within their range. If stream temperatures rise such that they are outside the suitable range for growth and reproduction, aquatic biota would be forced to respond by moving to suitable areas (typically upstream in Rocky Mountain watersheds) or potentially be extirpated from previously occupied areas. Research in the Pacific Northwest suggests that climate change is contributing to stream temperature changes that are negatively impacting the suitability of historically occupied stream habitat. In the Rocky Mountains, changes to stream habitat are not as well studied or defined.

The GMUG Aquatics Team has been monitoring stream temperature across the Forest since 2010. We use a combination of permanent and seasonally deployed stream temperature sensors at sites across the Forest. The objective of the monitoring program is to develop predictive stream temperature models for the Forest.

There are two ways stream temperature changes could affect habitat suitability for aquatic biota: elevated short-term (1-7 day) stream temperatures that cause mortality and elevated long-term (30 day) stream temperatures that affect growth, feeding, reproduction, and recruitment. The temperature data we have collected since 2010 allows us to evaluate the potential for climate change to alter the suitability of stream habitat over the next 20-75 years.

Most streams on the GMUG have 30-day average stream temperatures that are on the low end of productive for native Cutthroat Trout. Research suggests feeding, growth, reproduction and recruitment are highest when average stream temperature in the hottest 30 days of the year is between 12 and 18 °C (Roberts and Fausch 2015). Stream temperature data suggest the majority of mid- to high-elevation perennial streams have 30-day average temperatures on the low end of this range. If we assume climate change will result in a 1 °C increase in average stream temperature per decade it would take several decades for 30-day average stream temperatures to be outside the 12-18 °C window.

With design features in place that preclude activity in the WIZ, it is not realistic to conclude SBEADMR could synergize with climate change and negatively impact stream habitat suitability in the foreseeable future.

### **Design Features Specific to Amphibians**

#### **Wildlife, Fish and Rare Plants - 22**

Measures will be implemented to reduce the risk of spreading the pathogenic chytrid fungus *Batrachochytrium dendrobatidis* (*Bd*) among amphibians. *Bd* can remain infectious between 3-6 weeks in aquatic environments and as long as 12 weeks in moist soil; however, it is sensitive to heat and complete drying or desiccation. The USDA – FS Timber Sale Contract Standard Provision BT6.35 addresses equipment cleaning. Section b states that “Purchaser shall not move any Off-Road Equipment, which last operated in an area that is infested with one or more invasive species of concern onto Sale Area without having first taken reasonable measures to make each such piece of equipment free of soil, seeds, vegetative matter, or other debris that could contain or hold seeds.” The chytrid fungus *Bd* is an invasive species and thereby inclusive in Standard Provision BT6.35. As such for each Priority Treatment Area, a member of the Aquatics Team will work in conjunction with the Interdisciplinary Team, to include the Contract Administrator, ensuring all precautionary measures are taken to limit the spread of the amphibian chytrid fungus.

Equipment being transferred between sub-watersheds (6<sup>th</sup> level, 12 Digit HUC) will undergo complete drying for at least 24 hours (≥24hrs). This includes a minimum of 8 hours of drying

after the complete evaporation of ALL residual water on or in equipment. If due to weather or time constraints this is not possible, treatment with a steam pressure washer of >120°C (248°F) for at least one minute (≥1min) over the entire equipment will suffice. Additionally chemical disinfection is an option. Exposure of all surfaces for 20 sec to Path-X agricultural disinfectant or Quaternary ammonium compound 128 (active ingredient: dodecyl dimethyl ammonium chloride) will neutralize *Bd*.

#### **Wildlife, Fish and Rare Plants - 23**

As outlined in the Alternatives Activities Types project areas may undergo either commercial harvesting or non-commercial fuels reductions or a combination of both. In areas where Boreal Toads are known to exist the timing of ground based activities will be limited by the season. Since between July and late October Boreal Toads forage up to 1.6 miles from aquatic breeding sites, ground based operations of commercial and non-commercial equipment will be limited to when there is at least 4 inches of frozen soil or 4 inches of machine packed snow.

#### **Wildlife, Fish and Rare Plants - 24**

Where non-commercial fuel reduction treatments overlap the occurrence of Boreal Toad there will be no mechanical operations (i.e. mastication, etc). In these areas pile burning will be used to reduce fuels while concurrently minimizing ground disturbance, the possibility of indirect toad mortality and reduction or loss of hibernaculum habitat.

### **9. Consistency with Forest Plan Direction**

This project is consistent with Forest Plan direction.

### **10. Determination of Impacts and Effects, and Rationale**

NEPA: **Greenback Cutthroat Trout and Colorado River Cutthroat Trout:** 1) design features provide for basic protection of perennial streams and aquatic populations; 2) additional site-specific design features will be imposed around perennial streams supporting aquatic populations of recreational or conservation significance (see Table 2); 3) the Aquatics Team will participate in the planning, implementation, and post-project monitoring to insure mistakes that may occur are not repeated throughout project implementation; and 4) stream temperature monitoring and the best available science of stream temperature preferences of native Cutthroat Trout suggest the magnitude of changes to stream temperature across the GMUG is unlikely to affect negatively Conservation Populations for foreseeable future. *Therefore, we determine the project may adversely impact individuals, but is not likely to result in either a loss of viability in the planning area or cause a trend toward Federal listing.*

ESA: Following the rationale outlined in 9a (above) we conclude SBEADMR *may affect, but is not likely to adversely affect* Greenback Cutthroat Trout.

**Management Indicator Species:** As demonstrated in the Species Assessment, populations of Common Trout on the Grand Mesa, Uncompahgre, and Gunnison National Forests are widely

distributed, abundant with multiple age classes represented. While timber harvest associated with the SBEADMR project may occur near fish-bearing streams, design criteria included in the SBEADMR project will minimize the possibility of stream reach, population, or watershed-scale effects to these species. Forest Plan standards for Common Trout will continue to be met.

**NEPA: Boreal Toad and Northern Leopard Frog:** 1) Design features provide for basic protection of amphibian populations and their habitat; 2) while additional design features will be imposed around known breeding sites (see Table 2); 3) and the Aquatics Team will participate in the planning, implementation, and post-treatment monitoring to ensure that conservation measures are conducted throughout project implementation. Given these design features we *determine the project may adversely impact individuals, but is not likely to result in either a loss of viability in the planning area or cause a trend toward Federal listing for either Boreal Toad or Northern Leopard Frog.*

**ESA:** Following the rationale outlined in 10.A (above) we conclude SBEADMR *may affect, but is not likely to adversely affect Boreal Toad or Northern Leopard Frog.*

#### **11. Recommended Conservation Measures to Avoid, Minimize, or Mitigate Adverse Effects**

A member of the Aquatics Team will liaise with Colorado Parks and Wildlife fisheries biologists during the planning of all harvest activities near perennial streams and known populations of Boreal Toad. Prior to implementation the planning team will know 1) if the area or stream supports a population of recreational or conservation significance; 2) the recreational or conservation significance of populations that could be impacted; and 3) design features or constraints necessary to protect the amphibian or aquatic population and its habitat.

The design feature WQSP-2A defines a 100-foot Water Influence Zone (WIZ) for perennial streams and caps the surface disturbance of the potential ground cover within the WIZ at 20 percent. The design feature also prohibits equipment within stream channels during “fish spawning, incubation, and emergence periods.” If harvest activity is planned around a stream that is known or suspected to support a Conservation Population of native Cutthroat Trout the Aquatics Team will recommend a ban on the presence of equipment or harvest activity within the stream channel and WIZ. In some cases it may be necessary to extend the ban beyond the 100-foot WIZ. Participation by a member of the Aquatics Team in the planning and lay-out of timber harvest near these streams is critical. Additionally, the Aquatics Team will endeavor to assist the planning team in facilitating the harvest while insuring no negative impacts to the Conservation Population, stream habitat, or the watershed it occupies.

A member of the Aquatics Team will participate in implementation and post-project monitoring efforts to insure that design features successfully prevented or minimized negative impacts to watersheds, stream channels, and aquatic populations.

Additionally chemical disinfection is an option. Exposure of all surfaces for 20 sec to Path-X agricultural disinfectant or Quaternary ammonium compound 128 (active ingredient: dodecyl dimethyl ammonium chloride) will neutralize *Bd*.

## **12. Responsibility for a Revised Biological Evaluation**

*This Biological Evaluation was prepared based on presently available information. If the action is modified in a manner that causes effects not considered, or if new information becomes available that reveals that the action may impact endangered, threatened, proposed, or sensitive species that in a manner or to an extent not previously considered, a new or revised Biological Evaluation will be required.*

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